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**LEPROSY :**  
**SUMMARY OF RECENT WORK.**

**No. 1.**

[Reprinted from the *Tropical Diseases Bulletin*. 1924. March.  
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## LEPROSY.

MUIR (E.). **Some Notes on the Transmission of Leprosy.**—*Indian Med. Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 572–575. With 1 chart.

The available facts enable us to decide with a moral certainty how the bacillus enters the body. The organism cannot be cultivated, and healthy human beings in a good climate are commonly insusceptible even to inoculation with it. Among 60 members of the menial staff of the Calcutta School of Tropical Medicine 8 per cent. had leprotic anaesthetic patches without knowing it. Advanced mutilated begging anaesthetic lepers with trophic ulcers are not infective, as their skin and ulcers are free from the bacilli, although the Indian leper act is erroneously based on the belief that they are the dangerous persons. The nodular type is that of the infective cases, yet they feel well and continue their work, and during the reactionary stage of the disease they shed innumerable bacilli from their skins and ulcerated oro-nasal mucous membrane.

Early leprous lesions have never been found in the gastro-intestinal tract below the pharynx, which tells strongly against oral infection. The first noticed lesions in over 1,000 Indian asylum cases were chiefly on the extensor surfaces of the limbs, and in hilly regions frequently on the feet, and more still on the face, indicating direct infection through the skin of areas uncovered by clothes, a moist hot climate predisposing to infection as ROGERS showed. The promiscuous use of bedding favours house infections in India. There is presumptive evidence that, as in tuberculosis, a comparatively small proportion of those infected ever develop the disease owing to natural immunity. Voluntary segregation of infectious bacteriologically positive cases is advocated.

*Prophylaxis.*—MUIR therefore suggests as the most effective way of reducing leprosy the opening of out-door dispensaries in all provincial towns in all endemic areas under trained workers, for the treatment of early cases, advanced disfigured patients not being admitted, leprosy being even more suitable than tuberculosis for such treatment. Infections are mainly house ones in persons up to 20 years of age, and only 11 per cent. were attacked when over 40, conjugal infections being only 2·9 per cent. In 58 per cent. previous contact with lepers was traced, chiefly with infected parents or grandparents.

L. Rogers.

CHINA MEDICAL JOURNAL. 1923. July. Vol. 37. No. 7. pp. 562–567.—**The Diagnosis of Leprosy.**

This is a reprint of a pamphlet by Dr. E. MUIR, Leprosy Research worker of the Calcutta School of Tropical Medicine. After pointing out that the ignorant public fluctuate between panic on hearing of leprosy and indifference regarding contact with lepers, the importance of early diagnosis, to allow of rapidly efficient treatment, is emphasized. Diagnosis depends either on finding the lepra bacilli in the deeper layers of the skin (obtained by removing a portion of the whole thickness of the skin from a non-anaesthetic patch and staining smears from it); or on demonstrating the anaesthesia of the skin in the ordinary way. Other subsidiary signs are deep analgesia, loss of thermal sense, hyperaesthesia preceding anaesthesia, depigmentation, erythematous patches (often the first sign), thickening of the superficial nerves (ulnar, peroneal,

great auricular, radial and external saphenous nerves in that order of frequency), parakeratosis, anhydrosis, and interfollicular swelling (due to leprous infiltration of the skin between the hair follicles). The skin lesions have to be differentiated chiefly from syphilis, psoriasis and tinea; and the nerve cases from syringomyelia (in which loss of sensation to light touch is not an early or important symptom); and lung leprosy (in which large bundles of lepra bacilli may be found and the disease clears up more readily under treatment) may have to be distinguished from pulmonary tuberculosis, although rarely both may exist together. Leprosy may also co-exist with syphilis, hookworm, malaria, etc., and these must be treated if the leprosy is expected to improve.

L. R.

GOMEZ (Liborio). [In English and Spanish.] **The Question of the Initial Lesion of Leprosy.** *El problema de la lesion inicial de la lepra.*—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, pp. 227-229. In Spanish, pp. 263-265.

The first noticed manifestation of leprosy in 100 cases was numbness in 52, cold sensation in 1, red spots on the face in 16, and on the lower extremity in 9; white spots in 11 (half being on the face), nodules in 5, nasal lesions in 2, and miscellaneous in 4. Nervous manifestations were therefore most frequent, while multiple spots not rarely appeared at the same time, so it is not considered possible to point to any particular lesion as certainly the site of entry of the bacillus. Primary nasal lesions were rare.

L. R.

ANDŌ (Nihei). [**Klinische bakteriologische und serologische Studien ueber Lepra.**—*Fukuoka Ikw. Daig. Z.* 1921. Vol. 14. pp. 123-194. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 3. p. 260.]

273 specimens of the skin from 146 lepers were examined. The author disagrees with the present classification of cases, and prefers to divide leprosy into three stages similar to those of syphilis and tubercle. He found 8 species and 35 subdivisions of the lepra bacillus, which could be arranged in four main groups. He also carried out complement fixation experiments using leprosy bacilli and calf's heart-muscle as antigens.

L. R.

ROGERS (L.). **The Present Position of Leprosy Prophylaxis.**—*Jl. State Med.* 1923. Dec. Vol. 31. No. 12. pp. 569-584.

This paper begins with a rapid review of the present world-incidence of leprosy, especially as regards its correlation with humidity and temperature, a summary of the fuller account by the author which appeared in a recent issue of the *Transactions of the Royal Society of Tropical Medicine and Hygiene*. Other conditions tending to favour the spread of the disease, such as promiscuity, backward civilization, education and general hygiene, are then briefly dealt with. Very interesting figures are given to prove the greater susceptibility of the young and the effects of close contact, particularly with cases of the nodular form. The whole problem of prevention of spread may be summed up in

avoidance of contact between lepers and susceptible healthy individuals, a matter less easy of accomplishment than would appear on a superficial view, for it embraces several problems, such, for example, as the detection of cases in an early stage, and patients will naturally conceal the disease if they think that to declare it will entail forced separation from their relatives and friends. This attitude will only be overcome if they can look with a fair degree of hope towards a cure of their condition.

Instances are given of the good effects which have resulted from measures of segregation properly carried out in various countries, such as Norway, Sweden, Iceland, Eastern Canada, etc. A most instructive contrast is afforded by Hawaii. In 1865 a segregation law was passed and a settlement started at Molokoi, but the law was allowed to become a dead letter and the incidence remained little, if at all, affected. During the first 29 years of American control, with more stringent enforcement of the law, the rate per mille was reduced from 13·5 to 2·16, or less than one-sixth. Several of the British possessions are mentioned to illustrate the results of isolation and segregation when properly enforced and when carried out half-heartedly. In India the incidence rate has been reduced by half in the last 50 years, although even in 1921 only 7·7 per cent. of the known lepers were isolated; in 1911 the figure was 4·7. A great advance in the method of dealing with the leprosy question in India will be gained if the proposal to include in the leper colonies one section for the treatment of advanced and maimed cases in hospital, another for the "cottage" treatment of earlier cases, and a third for healthy children of lepers, is brought to a successful issue. In Ceylon, where segregation is inefficiently carried out, there has been practically no improvement.

Jamaica and Trinidad provide an instructive comparison. In the former segregation enforced has brought about a steady reduction, so that the incidence rate is less than half what it was 30 years ago, and "leprosy is now a rare disease." In the latter, measures are inefficiently carried out; compulsory segregation with insufficient accommodation and a system which does not prevent a considerable number of cases "absconding" have resulted in a steady increase in the incidence rate. The establishment of a Federal Leper Colony, as suggested by the Leprosy Commission of 1919, should ameliorate these conditions. Africa, more particularly South Africa and the Tanganyika Territory, is showing some degree of improvement since the matter was seriously taken in hand; prior to that time (1921) only a small proportion of those in an advanced stage of the disease was isolated and there had been a steady increase in incidence, as in all places where measures are formulated but not enforced. The ideal methods of prophylaxis consist of (1) Compulsory notification of cases by medical men and householders; (2) Compulsory segregation; (3) Detection of early cases by periodic examinations; (4) Prohibition to lepers of certain trades connected with food, clothing, etc.; (5) Removal of children of leper parents as soon as possible after birth; (6) Control of immigration.

This paper is a mine of information, and should be studied by all men practising in countries where the disease occurs. Space precludes even a mention of more than a few of the points dealt with.

H. Harold Scott.

GARCIA MEDINA (Pablo). **Profilaxis y estadística de la lepra en Colombia.**  
—*Gac. Med. de Caracas*. 1923. Feb. 28. Vol. 30. No. 4. pp. 56–59.

A most interesting paper. The author affirms that the number of lepers in Colombia recorded in American and European books, namely 20,000, is far in excess of the actual number, which is between 6,000 and 7,000. The law relative to notification is very strict, so that it is improbable that the total exceeds appreciably the official returns of 6,568, or about 1 per 1,000 of the population.

As far as possible, segregation is carried out on the colony system. 5,440 (or 79 per cent.) are thus dealt with in the lazarettos; 2,271 [the figure is given elsewhere as 2,771, but the lower is probably correct] at the "colony" of Agua de Dios; 2,456 at that of Contratación; and 213 at Caño de Loro, situated on a small island in the Atlantic.

By the colony system the patients live as nearly as possible a normal life, civically, socially and industrially. There are magistrates, police, a municipal council, and so forth. Well-staffed and well-equipped hospitals and schools are provided, entertainments and recreation arranged for, and land allotted for cultivation. Each colony has its own metal money which is valueless elsewhere.

As regards the type of disease, 60 per cent. are of the nodular variety, 30 per cent. of the nervous, and 10 per cent. mixed. The idea that leprosy is a poverty disease is controverted in Colombia; the majority of sufferers are agricultural labourers who earn good wages, and the disease is more prevalent in rural districts than in towns. The influence of climate is noted. The incidence is greatest (55·9 per cent. of the whole) where the mean annual temperature is between 20° and 24°C. and the relative humidity is high; next to this are districts with a temperature between 25° and 28°C., or 14° and 18°C. Warm and dry areas with a temperature of 29°–32°C., or cold districts (8°–12°C.) present the fewest cases.

In the matter of treatment good results were obtained temporarily by the use of atoxyl in doses of 30–50 cgm. daily, and by sodium salicylate or methyl salicylate. The amelioration, however, was not maintained and these forms of treatment have been largely superseded by chaulmoogra oil.

Intravenous injections of sodium gynocardate did not yield satisfactory results. 350 patients have been treated with the ethyl esters of chaulmoogra with marked benefit.

H. Harold Scott.

RUTOWITCZ (Bernardo Leibowitz). **Tratamento e prophylaxia da Lepra.**—*Sciencia Medica*. Rio de Janeiro. 1923. Oct. 31. Vol. 1. No. 4. pp. 173–180.

During the twelve months ending June 1923, there were 526 new admissions to the Institute for the Treatment of Leprosy, Pará. 298 were definite cases of the disease and 228 were admitted for observation. Of the 298 there were 83 of the tuberculous form, 201 of the anaesthetic, and 14 mixed. The treatment adopted was chiefly that of Heiser, chaulmoogra oil in camphorated oil, but intravenous injections of hydnocarpate of sodium and the ethylic esters of chaulmoogra oil were used for some cases. Detailed records were kept of the history, symptoms, treatment and progress of each patient. The main drawback of Heiser's treatment is the development of local

abscesses, attributed to the action of resorcin contained in the preparation employed. Persistence in treatment is essential. Thus, one patient on admission showed atrophy of the hands and loss of tactile sense, a macular patch on the forehead, thickening of the ulnar nerve, inguinal adenitis, commencing deformity of the ankles, loss of hair, etc. During the ensuing 18 months he was given 150 injections, and at the time of writing "all has disappeared; the patient has the aspect and sensation of a healthy individual."

H. Harold Scott.

PUBLIC HEALTH REPORTS. 1923. Aug. 10. Vol. 38. No. 32. p. 1817.—**Paroled Lepers from Kalihi Hospital, Hawaii.**

Derivatives of chaulmoogra oil have been used since July 1916, and mixed esters since July 1919. Between 1912 and 1917, 34 lepers were paroled, or a yearly average of 5.7, 10 were set free in 1917, while from 1918 to 1922 no less than 193 were paroled, or a yearly average of 48.2. Up to June 30th 1923, 44 paroled cases had returned to hospital, 7 of whom had been paroled again.

L. R.

WADE (H. W.) & BASA (Jose Avellana). **The Culion Leper Colony.**—*Amer. Jl. Trop. Med.* 1923. Sept. Vol. 3. No. 5. pp. 395-416. With 2 plates. [1 ref.], & *Monthly Bull. Philippine Health Service.* 1923. Mar. Vol. 3. No. 3. pp. 93-103.

The interest aroused in the treatment of leprosy by investigators in India and Hawaii led the Philippine authorities to grant appropriations for extending the work of the Culion Colony in 1921, and the work was expanded on the arrival of Governor-General WOOD in 1922. This paper gives an interesting account of the history of the colony as a preliminary to subsequent reports. It is too long to be easily summarized, and should be read by all interested in the subject.

L. R.

- i. MARSHALL (Edward R.). **What the United States Public Health Service is doing to prevent the Spread of Leprosy in the Continental United States.**—*Milit. Surgeon.* 1923. Oct. Vol. 53. No. 4. pp. 313-320.
- ii. OLIVER (Thomas). **A Visit to a Leper's Colony.**—*Lancet.* 1924. Jan. 5. p. 57.

i. After two-score years of persistent efforts Congress passed "an act to provide for the care and treatment of persons afflicted with leprosy and to prevent the spread of leprosy in the United States," and provided funds for the purpose, but the difficulty of finding a site was only solved when the Louisiana Leper Home at Carville was taken over in January 1923. It soon contained 172 lepers, 100 more are awaiting accommodation, which is now being supplied, while the total numbers in the United States are estimated at fully 1,000. Comfortable conditions, good treatment, land for cultivation, and amusements are provided, making the settlement a model one.

- ii. This paper describes a brief visit to the Carville Colony.

L. R.

MEIRELLES (E.). [**Leprosy in Children.**—*Arch. Latino-Amer. de Pediatria.* Buenos Aires. 1923. Apr. Vol. 17. p. 250. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Aug. 4. Vol. 81. No. 5. pp. 426-427.]

Of 116 cases of leprosy in children seen in 21 years in Rio de Janeiro only 3 were infants and 6 were between 2 and 6 years of age. All were from contagion, none were congenital cases, which seem to be extremely rare.

L. R.

JEANSELME (M. E.). **Sur un cas de lèpre contractée à Paris.**—*Bull. Acad. Méd.* 1923. Dec. 18. Year 87. Vol. 90. 3rd Ser. No. 43. pp. 595-597. [3 refs.]

A young man developed macular leprosy of a typical and extensive nature with some thickening of the nerves, although he had been born and lived all his life in Paris. His mother was healthy; his father had served in French Guiana and in Tonkin and Cochin China from 1891 to 1905, but was free from the disease on returning to Paris in the latter year. The son was born in 1907 when his father was still free from signs of leprosy, which first appeared on the face of the father in 1913, eight years after he left the endemic areas of leprosy. Lepra bacilli were found in the nasal mucus of both, and it is extremely probable that the son contracted the disease while living in the house of his affected father in Paris. In spite of the commonly held opinion that the disease is not infectious in the temperate zone, three other cases of apparent infection in non-endemic areas of France have been reported in recent years. The author therefore requested that the permanent leprosy commission of the Academy of Medicine should study the prophylactic measures necessary to prevent the propagation of leprosy in France, as he estimated the number of lepers in Paris at the present time at 150 to 200.

L. R.

FERNANDO (Antonio S.). [In English & Spanish.] **Ocular Manifestations in Leprosy as observed at Culion, P.I.** **Las manifestaciones oculares en la lepra observadas en Culion, P.I.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English. pp. 230-236. With 3 figs. In Spanish. pp. 266-270. [3 refs.]

The author has studied the ocular lesions in the Culion settlement, and points out their occurrence in increasing numbers with duration of the disease, the proportion of such complications in 400 cases varying from 95 per cent. in advanced cases of 15 years' duration to 21 per cent. among those of 8 years' duration. Patients showing involvement of the adnexa, eyebrows and eyelids numbered 178, and of the eye-ball 125, iritis (29) and keratitis (21) being the most common lesions. Blindness of one eye was seen in 23 and in both in 9, with an average duration of leprosy of 14 years. Great care in the administration of chaulmoogrates is necessary when inflammatory eye-symptoms are present for fear of reactions endangering sight.

L. R.

SUGAI (Takekichi). [**Ueber die Lepra der Schleimhaut der Mundhöhle.**]  
—[Leprous Lesions of the Oral Mucosa.]—*Hifu Hitsunyoki Z.*  
Tokyo. 1921. Vol. 21. pp. 228–242. [Summarized in *Japan.*  
*Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 3. pp. 259–260.]

A study of four lepers showed on the tongue superficial small nodules, in the throat small soft smooth pustules with slight infiltration, and in the nose and larynx as well as in the salivary glands many lepra bacilli. The tonsils were often affected in advanced cases, but the lower part of the trachea and the alimentary canal were always free from lesions.

L. R.

WALKER (Ernest Linwood), MACARTHUR (Charles G.) & SWEENEY (Marion A.). **Second Progress Report on the Investigation of the Chemotherapeutics of Chaulmoogra Oil and its Derivatives in Leprosy and Experimental Tuberculosis.**—*Collected Reprints from the George Williams Hooper Foundation for Medical Research.* No. XVI. 1922–1923. Vol. 7. Reprinted from *Trans. 18th Ann. Meeting Nat. Tuberculosis Assoc.* pp. 553–561. [1 ref.]

This paper records interesting biochemical investigations on the absorption of derivatives of chaulmoogra oil by means of a test the authors devised with the aid of the polariscope, enabling amounts as small as one milligram to be detected in the tissues. They found that butyl and propyl esters were less irritating to the tissues than ethyl esters, and that in whatever form chaulmoogric acids are administered they are metabolized like ordinary fats after the compounds have been hydrolyzed. They are well absorbed from the alimentary tract, but disturb the stomach, and are more quickly absorbed by the intramuscular than by the subcutaneous route, and roughly in proportion to the dose. When injected into the blood they disappear from the circulation in a few minutes and they do not penetrate tubercular tissues in demonstrable amounts, being rapidly oxidized in the system. If repeated large doses are injected, the drug accumulates in the liver. It is more toxic by the intravenous method. The therapeutic experiments on tuberculosis in rabbits are not yet completed, but the present indications are that their action is slight, if any, being less active against the tubercle bacillus in vivo than in vitro.

L. R.

WADE (H. W.). [In English & Spanish.] **Preliminary Notes on Results of Leprosy Treatment at Culion Leper Colony.** **Notas preliminares sobre los resultados del tratamiento de la lepra en la colonia leprosa de Culion.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, pp. 236–241. In Spanish, pp. 270–275.

This valuable paper from the Culion Settlement deals with by far the most extensive trial yet carried out of the improved treatment of leprosy. Prior to May 1st 1921 the staff was insufficient to enable any but concurrent affections among the 4,500 lepers to be treated, but it was then strengthened by four physicians, and 500 cases were examined carefully in the next two months as a preliminary to regular treatment. Intravenous injections of ROGERS's preparations were soon dropped owing to vein troubles, and chaulmoogra ethyl esters, plain or iodized, were given intramuscularly. By April 1922 the number had been gradually increased to 1,500 cases, and in the following year to 4,067,

which had been treated for variable periods of time. A survey on September 30th 1923 showed improvement in 55.9 per cent., while in 36 per cent. more the progress of the disease had been checked, 6.4 per cent. were worse, and 1.7 per cent. had died, and under the circumstances "it is felt that this result is far from discouraging." The Mercado-Heiser group gave 37 per cent. improved, plain morrhuc ethyl esters 34 per cent. improved of 44 cases, and the same drug iodized 45 per cent. improved out of 80 cases. Females improved more than males, and the age groups of 20, 40, and 60 years improved more than those of 10, 30 and 50 years of age, especially females of 50, which variations are attributed to the disturbing influence of sexual activity from 20 to 30 and the menopause about 50. Cases of one to two years' duration showed most improvement, after which there was a steady decline. Still more important is the time under treatment as shown in the following figures, which are most encouraging:—

Time under treatment.	Under 3 months.	3-6 months.	6-9 months.	9-12 months.	12-15 months.
Percentage improved	26%	42%	74%	81%	93%

The further progress of this crucial test will be awaited with much interest, as the above results suffice to establish the great advantages of the new principle of injecting soluble products of chaulmoogra and other oils.

L. R.

LARA (C. B.). [In English and Spanish.] **Observations on Clinical Aspects of Leprosy Treatment at Culion Leper Colony.** **Observaciones sobre los aspectos clinicos del tratamiento de la lepra en la colonia leprosa de Culion.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, pp. 241-247. [5 refs.] In Spanish, pp. 275-280.

This paper deals with the clinical aspects of the Culion treatment and brings out the following points. The intramuscular injections of ethyl ester chaulmoograte were usually given once a week in doses beginning with 0.5 cc., increased by 0.5 cc. at a time up to 4 or 5 cc., reduced or temporarily suspended if much reaction occurs. In early cases the lesions may recede or nearly disappear in about three months; in moderately advanced ones in three to six months, the lesions becoming swollen and inflamed and apparently worse for one to three weeks and then noticeably shrinking, or occasionally ulceration followed by healing may take place. In advanced cases of the nodular or mixed type very little change is usually seen after six months, while not a few appear to be worse. In nerve cases a few show improvement, but advanced cases as a rule remain stationary for months, and the disease may even progress. In some cases the improvement is not sustained. In cases complicated with tuberculosis great caution is required, as in 275 cases all showed symptoms leading to suspension of the drug, while 31 per cent. are believed to have been permanently injured; the symptoms were less under ethyl morrhuate. The deaths from tuberculosis in the colony increased during the past year, but had rapidly increased during recent years, 20 to 30 per cent. of the lepers being tuberculous, while the ratio of deaths from this complication to the total deaths has increased from 1 to 4 in 1915 to 1 to 2 in the first six months of 1922, partly due to better diagnosis, autopsies being done only since 1922. Nephritis also appears to be increasing, especially

due to secondary infections in ulcerated cases. Hookworm disease is also prevalent, and it has not yet been possible to carry out a campaign against it. The author concludes that "both impressions of the staff and patients and the statistical data indicate that the treatment is, on the whole, productive of much benefit, and is distinctly promising in those cases that are not too advanced or are too badly affected by complications for marked or permanent relief to be expected."

L. R.

MUIR (E.), assisted by LANDEMAN (E.), ROY (T. N.) & SANTRA (I.).  
**The Treatment of Leprosy in the Light of the Nature of its Spread through the Body.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 543–578. With 14 figs. and 2 charts. [2 refs.]

This valuable paper records Dr. Muir's Calcutta researches on the treatment of leprosy, and brings out clearly the necessity of considerable experience and careful attention to detail if the best results are to be obtained. The principles underlying the treatment are the necessity of strengthening the body resistance and inducing repeated small reactions due to breaking up and setting free the bacilli in the tissues, which must be carefully controlled to prevent their being excessive, and of avoiding passive congestion in the lesions. A rise of temperature may be beneficial; a case in which the onset of kala azar cleared up the leprotic lesions is mentioned. Exercise strengthens the body, enabling it to destroy the bacilli and assist the cure, and also prevents capillary congestion. Cases complicated with syphilis or with a strong Wassermann reaction should be also treated for this disease, hookworms should be expelled and the general health maintained. Without attention to these points the specific treatment is not nearly so effective.

Ethyl esters prepared from chaulmoogra, hydnocarpus, olive, linseed, cod-liver, neen and gurjum oils have been injected by various routes, the subcutaneous or intramuscular being generally used; the addition of an equal quantity of olive oil greatly diminishes the pain due to those methods of administration, while the addition of 4 per cent. creosote is advised, except when the drug is sterilized in ampoules. Improvement appears to be dependent on obtaining reactions, even if only slight ones, with swelling and softening of the nodules, which in nerve cases may cause severe pain requiring morphia, the benefit appearing to result from the circulation of bacilli or their toxins thus set free. Control injections of creosote and olive oil produced little benefit, showing that the specific effect was due to the ethyl ester hydnocarpate. The use of ethyl esters of linseed and olive oil gave rather better results than those of hydnocarpus and chaulmoogra oils, but the number of cases was too few to establish fully this important point. In eight leper asylums trials of the hydnocarpate esters in 179 cases showed 31 worse, 41 stationary, 48 slightly improved, 58 much improved, and in 3 all signs disappeared, but in many cases the duration of the treatment was insufficient. At Dichpali, where special care was taken, no less than 66 per cent. showed "much improvement" or "all signs disappeared," 12.5 per cent. falling into the latter class, showing the necessity of skilled individual attention. Injections of the hydnocarpate esters into the skin lesions caused the most rapid improvement, which so impressed the patients that they put up with the pain. The first dose by either method should be only 0.25 cc. and it is advisable to take the temperature four times daily, so as to regulate the rapidity

of the increase of the doses by the reactions observed. The drug is injected intramuscularly, and the doses are increased according to the tolerance of the patient, some standing as much as 6 to 7 cc. twice a week. If 2 cc. doses, intramuscularly, fail to produce reactions, divided doses should be injected beneath the lesions, of the skin or nerve, but not into the nerves. If a patient loses weight after reactions stop the drug for one or two weeks. In initial lesions the doses may be rapidly increased, but when there are extensive bacillus-containing lesions greater caution is necessary, so as not to break up and set free too many bacilli at a time. In some cases the injection of a vaccine of Kedrowsky's acid-fast bacillus may be beneficial. Antimony, arsenic and iodides have also been tried, but it is too early to report on them.

The prognosis depends on the age of the patient, his digestive powers, habits regarding exercise, mental attitude and the duration of the disease. Muir concludes that early and persistent treatment arrests the disease and causes gradual disappearance of its signs and symptoms, although he does not consider that a specific cure has yet been discovered; treatment should be continued long after the skin and mucous membranes have become free from bacilli.

L. R.

CHINA MEDICAL JOURNAL. 1923. July. Vol. 37. No. 7. pp. 572-576. With 1 text fig.—**The Treatment of Leprosy by the Infiltration Method.**

This is a reprint of a pamphlet issued by Dr. E. Muir from the Calcutta Leprosy Research Department, describing the method of injecting his E.C.C.O. mixture into the dermal lesions of leprosy. The needle of the syringe is inserted as far as it will go in different directions from punctures made at opposite edges of the patch, and as it is withdrawn drops of the mixture are injected so as to filtrate the loose subcutaneous tissue of the whole patch. This is done twice a week or oftener as long as no marked reaction is produced. The mixture contains 1 to 2 cc. of the ester, 0.5 gram camphor, 0.5 cc. of double distilled creosote, and 3 cc. of olive oil free from fatty acids, the olive oil being sterilized by heating to half an hour on a water bath before being added. The drug is absorbed more rapidly than by ordinary injection, and produces general as well as local improvement; only slight pain at the time of injection results, and the more rapid improvement of the treated areas encourages the patient.

L. R.

BIELING. **Chemotherapie und innere Desinfektion. II. Lepra und Tuberculose.**—*Deut. Med. Woch.* 1923. Sept. 21. Vol. 49. No. 37-38. pp. 1214-1216. [43 refs.]

This paper consists mainly of a theoretical discussion of the principles of chemotherapy as applied to leprosy and tuberculosis, suggested by recent work on the former disease. After referring to the use of "antileprol" by ENGEL in Cairo in 1909, he goes on to discuss DEAN's work on ethyl ester chaulmoogrates and quotes the following interesting figures regarding McDONALD's results in the Philippines. Out of 142 cases in which treatment was begun on January 2nd 1918, by October

of the same year 7 had died, while 94 were cured, none of the latter having relapsed in 1921, so that a large number of cases had remained well for 2 to 3 years. The drug was usually well borne, although 10 per cent. could not take the injections regularly. Propyl and butyl esters gave rise to no trouble and the results were equally good.

L. R.

ENGEL (Fr.). **Die Behandlung der Lepra mit dem Äthylester des Chaulmoograöls.**—[Treatment of Leprosy with Ethyl Esters of Chaulmoogra Oil.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. July. Vol. 26. No. 6. pp. 161-164. [2 refs.]

With reference to DEAN'S work on the use of ethyl ester chaulmoogrates in leprosy, it is pointed out that this preparation was formerly made by Bayer's firm under the name of "antileprol" and used with beneficial results in 60 lepers, as reported in 1909 at the Bergen International Leprosy Conference and in subsequent papers.

L. R.

HUIZENGA (Lee S.). **Note on the Treatment of Leprosy.**—*China Med. Jl.* 1923. July. Vol. 37. No. 7. p. 567.

The writer reports favourable results in leprosy with weekly injections of the mixed ethyl esters of chaulmoogra oil made in the Pekin Union Medical College. He points out that a series of patients, who were given plenty of wholesome food in addition to the drug, did better than those treated without that advantage.

L. R.

HAGMAN (G. L.). **On the Treatment of Leprosy with Dean's Derivatives of Chaulmoogra Oil.**—*China Med. Jl.* 1923. July. Vol. 37. No. 7. pp. 568-571.

Six patients undertook to undergo a year's treatment; the one who continued for the full year became clear of symptoms and bacteriologically negative, while improvement was obtained in other cases after shorter courses.

L. R.

TIETZE (Samuel). [In English and Spanish.] **Antileprotic Treatment as instituted at San Lazaro Hospital. Tratamiento antileproso empleado en el hospital de San Lazaro.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, p. 247. In Spanish, p. 281.

This is a very brief report on treatment at the San Lazaro Hospital of Manila by ethyl chaulmoogrates intramuscularly. Reactions were noted in 10 per cent., encouraged by exercise; 300 cases were treated. No information is given regarding the results obtained.

L. R.

ORTIZ (Pedro N.). **La lepra y su nuevo tratamiento.** [New Methods of Treatment of Leprosy.]—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 27-39. With 27 plates.

Intramuscular injections of the ethyl esters of chaulmoogra prepared in the Chemical Laboratory of the University of Hawaii were administered to 40 patients. Nine improved markedly and in three of these all the signs disappeared. Eleven showed slight amelioration only, while thirteen remained in the same condition as at first. Eight of these last were suffering from the nervous type, and it is clear that when there are paralytic lesions and deformities a marked degree of improvement is not to be expected. The disadvantages of these injections are: great pain, severe local reaction leading to the formation of abscesses, and a rise of temperature to 38°-40° C. continuing perhaps for 8 to 12 weeks. In seven of this series the treatment had to be suspended, owing to these causes or to intolerance of the drug, for periods varying from 4 to 29 weeks. If well borne the injections are given in doses of 3 gm. twice a week.

Intravenous injection of the combined ethyl esters was also employed, beginning with 25 cgm. weekly and increasing each time by the same amount to a maximum of 3 gm.; this appeared to be the limit of tolerance. Shivering, rise of temperature, and a troublesome dry cough often followed, the last being prevented by a dose (0.015 gm.) of heroin ten minutes before the injection. Six patients received two doses weekly of 3 gm., and thirteen one dose. The author remarks on the rapid amelioration following this form of treatment and intends to use it more frequently and in larger doses.

H. Harold Scott.

HAMZAH (Mohamad). **Thymol-injecties tegen Lepra.** [Thymol Injections against Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 5. pp. 732-733.

This is a short preliminary note recommending intramuscular injections of 10 per cent. thymol in cod-liver oil, 4 cc., every three days at the beginning, later on once a week. The author reports very favourable results of this treatment.

W. J. Bais.

HAMZAH (Mohamad). **Ueber Behandlung der Lepra mit Thymol. Vorläufige Mitteilung.** [Treatment of Leprosy with Thymol. Preliminary Communication.]—*Klin. Woch.* 1923. Oct. 15. Vol. 2. No. 42. p. 1963.

Observations on the treatment of 14 cases of leprosy with thymol 10.0, cod-liver oil 90.0 are recorded, 4 cc. being injected intramuscularly every fourth day for the first month, and then once a week. The author was led to try this by using thymol in the place of carbolic acid as an antiseptic added to sodium morrhuate, when he noted definite improvement after two injections, although without the thymol no improvement had taken place, the patient now becoming able to take up work. In other cases the thymol injections were followed by

evident and rapid improvement, the nodules becoming flatter and paler, followed by pigmented scarring, but they eventually became white. In some cases reappearance of the eyebrows and hairs on formerly anaesthetic patches, and regrowth of a finger nail were noted, a claw hand regained power, perforating ulcers healed after two injections, as did those on the legs. A fuller report is promised later.

L. R.

HEGGS (T. Barrett). **A Note on the Treatment of Leprosy.**—*Brit. Med. Jl.* 1923. Dec. 29. pp. 1253–1254.

A nine months' trial of oscol and colloidal antimony at Bagdad is reported in fifteen bacteriologically positive cases, with distinct improvement in most cases up to about three months, when it came to a standstill before the nodules or bacilli had disappeared. Similar temporary improvement followed intravenous injections of chaulmoogra oil and ether. An occasional case improved greatly.

L. R.

NOËL. **Traitement de la lèpre par les sels de terres rares.**—*Ann. de Dermat. et de Syph.* 1922. Oct. 6th. Ser. Vol. 3. No. 10. pp. 475–494.

In view of the reported value in surgical forms of tuberculosis of the salts of rare earths of the group "cerium" prepared in the laboratories of FOURNIER, ROBERT and CARRIÈRE, Noël in Cameroon has tested their value in 7 cases of leprosy by the intravenous method, giving 8 to 10 cgm. doses in a 2 per cent. solution daily for 20 days, repeated with intervals of 15 to 20 days up to six series, in all 120 injections, in the course of eight months. In two cases distinct improvement took place, although far from complete resolution; in 4 the condition remained stationary; while in 1 the lesions increased considerably in spite of the treatment; the results not being satisfactory on the whole.

L. R.

i. PHIPPS (F.). **A propos du traitement de la lèpre par l'Eparseno. Purpura aigu hémorragique provoqué par le traitement.**—*Maroc.-Médical.* 1923. June 15. No. 18. pp. 176–178. [1 ref.]

ii. DELAMARE (G.) & ACHITOUV. **Lèpre mixte éparsénorésistante.**—*Bull. Acad. Med.* 1923. Dec. 4. Year 87. Vol. 90. 3rd Ser. No. 41. pp. 488–492. With 1 chart in text.

i. The author reports a case of nodular leprosy in which the use of eparseno, as advised by J. HASSON and by GOUGEROT (this *Bulletin*. Vol. 20, p. 164), not only failed to benefit the disease, but gave rise to a serious intoxication complicated by acute purpura and severe haematemesis.

ii. After referring to the success of HASSON, GOUGEROT, ABERASTURY and BALINA, CHARTRES and ROBINEAU with eparseno in leprosy, and the failures of HUDELO and RICHON, JEANSELME, MARCHOUX and PHIPPS, the author records a case of nodular leprosy in which during two months' treatment with a total of 30 cc. of the drug the reactions obtained were not followed by absorption of the lepromata or other benefit, while the patient lost 10 kilos. in weight.

L. R.

KRAUS (R.). **Beitrag zur Vakzinetherapie der Lepra, Vorgetragen am intern. Leprakongress in Rio de Janeiro.**—*Wien. Klin. Woch.* 1923. Nov. 15. Vol. 36. No. 46. p. 812.

This paper is a preliminary report on a trial of vaccines of Duval's, Devcke's and Kedrowsky's bacilli killed by ether in the treatment of leprosy in South America. Emulsions in physiological salt solution in doses of 50, 100, 500, & 1,000 millions were injected every 4–6 days. Professor SOMMER first used it, but gave it up on account of the severe reactions. During the last year Dr. SCHRODER tried it in the infectious hospital and found the reactions to vary from local inflammation or suppuration, through mere infiltration of the tissues to no reaction at all, while in some there was a rise in temperature. In anaesthetic forms they noted frequent return of sensation, while the bacilli disappeared from the nose, and improvement was noticed in all three types of the disease. Although he is not yet prepared to give a definite opinion, he thinks the method promising. Some other medical men report not unfavourably.

L. R.

WALKER (Ernest Linwood). **Contributions to the Bacteriology of Leprosy. II. The Chromogenic Acid-fast Bacillus of Clegg.**—*Amer. Jl. Trop. Med.* 1923. Sept. Vol. 3. No. 5. pp. 417–424. [9 refs.]

Cultures were first made from swabs of nasal or shin lesions containing many lepra bacilli on Musgrave and Clegg's medium (which, consisting essentially of agar and water, is of very low nutrient value) in symbiosis with amoebae and cholera vibrios. In a small percentage acid-fast bacilli developed after several weeks, and were easily subcultured. Similar results were obtained on the same medium in the absence of the symbiotic organisms, and similar acid-fast bacilli were obtained free from diphtheroids on transplanting from the primary colonies of the pleomorphic partially acid-fast diphtheroid of Bordoni-Uffreduzzi into Musgrave and Clegg's medium, and again on transplanting the smegmal diphtheroid on to the same medium. Further, a non-chromogenic acid-fast bacillus differing from Clegg's bacillus was obtained from non-leprous nasal secretions. The author therefore concludes that Clegg's bacillus appears to be a developmental stage of Bordoni-Uffreduzzi's diphtheroid, but it may possibly be a contamination, and "this organism appears to be identical with or very closely allied to the pleomorphic and facultative acid-fast so-called *Bacillus smegatis*."

L. R.

TAMIYA (Sadasuke). **[A Morphological and Biological Study of *Bacillus leprae*.]**—*Okayama Ig. Kw. Z.* 1921. pp. 633–662. With 1 plate. [Summarized in *Japan. Jl. Med. Sciences*. Tokyo. 1922. Vol. 1. No. 2. p. 162.]

"The author found that *Bacillus leprae* can be proliferated to a certain extent in the phosphoric acid glycerin broth, when inoculated with small pieces of leprous tissues. The cultured bacilli take certain periodical changes, which can be repeated in the same medium. One course takes about 30 days. The changes are, a large bundle shaped agglomeration of the bacilli as is seen in the initial stage of the culture of tubercle bacilli, which gradually assumes a normal form, and then diphtheroid form, and

then a short wedge-form, and then again assumes a large cluster as in the beginning. During the entire course of the cultivation the bacilli always maintain acid fastness. In a potassium cyanate broth medium, the bacilli assume a remarkable granular appearance, and all the forms, including the granular, that are found in the medium take a deep stain by *Ziel's* solution. The straight granular form will be seen to set free the granules, and the bacillary bodies that had set free those granules contain a vacuole, and present something like a sporogenic form."

L. R.

- i. KUJO (Koretake) & CHUMA (Masaru). [**Histologische Studien ueber Lepragewebe mittelst vitaler Färbung.**] [Vital Staining in the Study of Leprous Tissues.]—*Osaka Ig. Kw. Z.* 1921. Vol. 20. pp. 1214–1232. With 1 fig. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. pp. 67–68.]
- ii. KUJO (Koretake). [**Leprazellen und vitale Färbung.**]—*Tokyo Ij. Shsh.* 1921. pp. 795–802. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 68.]

i. Sodium carmine and indian ink were injected into lepra nodules during life. The epithelial cells and the giant cells for the most part did not take up the carmine stain well, although some of the black particles were taken up.

ii. Carmine solutions and trypanblue were injected into the affected skin of a leprous patient and the bacilli proved to be not colourable with very few exceptions.

L. R.

LLOYD (R. B.), MUIR (E.) & MITRA (G. C.). **The Wassermann Reaction in Leprosy.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 229–233. [1 ref.]

The Leprosy Research Worker and the Serologist of the Calcutta School of Tropical Medicine have taken advantage of their exceptional opportunities to carry out Wassermann tests in 286 cases of undoubted leprosy, with the following results :—

"1. In a series of 228 adult lepers we find a positive Wassermann Reaction in 41·7 per cent. of all cases, in 27 per cent. of anaesthetic cases, in 47·4 of mixed cases, and in 63 per cent. of nodular cases.

"2. In a series of 58 leper children we find a positive Wassermann Reaction in 62 per cent. of all cases, in 47 per cent. of anaesthetic cases, in 80 per cent. of mixed cases, and in 100 per cent. of nodular cases, *i.e.*, very much higher figures than in adults.

"3. A control of 46 untainted children from the same community as (2) above and whose parents or guardians were lepers showed no evidence of a higher positive Wassermann rate than can probably be accounted for by the average syphilis rate."

The authors hope to report later on the influence of treatment on the reaction.

L. R.

LEWIS (Paul A.) & ARONSON (Joseph D.). **The Complement Fixation Reaction as applied to Leprosy.**—*Jl. Experim. Med.* 1923. Aug. 1. Vol. 38. No. 2. pp. 219–232. [57 refs.]

A survey of the literature reveals contradictory results and no satisfactory generalization on this subject, and the writer's work on tuber-

culosis suggests that this is due to modifications of the Wassermann reaction being too closely followed, since they found longer periods than the usual one hour at 37°C. necessary for fixation of acid-fast bacilli. In their experiments they tested 45 sera from 39 lepers, together with a number of non-leprous sera, using as antigens various acid-fast bacilli (including those believed to have been cultivated from lepers by their discoverers), bacillary emulsions, alcoholic extracts, Petroff's antigen and cholesterol, and acetone antigens, with two hours' incubation. *B. leprae* of Clegg, Duval and Kedrowsky, *B. tuberculosis* and Petroff's antigen (T.B.) all gave numerous positive results varying between 81.8 and 96.8, Clegg's bacillus being highest with 93.9 per cent. ; *S. tuberculosis*, with cholesterol and Acetone-insoluble gave 65.9 and 63.6 per cent. of positive reactions. None of the controls sera gave any positive results with Clegg's organism, which may therefore be of practical value in diagnosis, although these reactions are no evidence of any of these bacilli being the cause of leprosy in view of the most frequent reactions being obtained with the tubercle bacillus. Antibody absorption may be demonstrated in the acid-fast group if the absorbing bacteria are removed by filtration.

L. R.

YAGLE (Elizabeth M.) & KOLMER (John A.). **The Kahn Precipitation in Leprosy.**—*Arch. Dermat. & Syph.* 1923. Aug. Vol. 8. No. 2. pp. 183–185. [3 refs.]

The frequent occurrence of positive Wassermann reactions in cases of leprosy led the authors to test whether the serum of lepers, like that of syphilitics, would give positive precipitation or flocculation reactions with alcoholic extracts. They used the Kahn precipitation method (*vide Arch. Dermat. & Syph.*, Sept. 1922). Of 28 leper serums tested, 23 showed no evidence of syphilis and gave negative reaction ; in two with suspicions of syphilis the reaction was doubtful ; and in three having clear evidence of syphilis the reaction was positive. The inference is obvious.

L. R.

i. HERXHEIMER (Gotthold). **Die Lepra und ihre Parallelen zur Tuberkulose.**—*Klin. Woch.* 1923. June 4. Vol. 2. No. 23. pp. 1053–1059.

ii. MARCHOUX (E.). **La lèpre du rat et sa transmission probable à l'homme.**—*Paris Méd.* 1923. Oct. 27. Vol. 13. No. 43. pp. 313–316. With 2 figs. [4 refs.]

iii. NOËL (P.). **Les nouveaux traitements de la lèpre.**—*Ann. de Dermat. et de Syph.* 1922. Dec. 6th Ser. Vol. 3. No. 12. pp. 644–653.

iv. KÄYSER (J. S.). **Verpleging en behandeling van lepralijders.** [Care and Treatment of Lepers.]—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leiden. 1923. July 16. Vol. 9. No. 1–2. pp. 84–105. [English summary, pp. 103–104.] [19 refs.]

i. A general discussion of well known facts.

ii. This deals with work already reviewed in this *Bulletin*, Vol. 29, pp. 825–826.

iii. This paper gives a brief summary of the advances of recent years in the use of soluble preparations of chaulmoogra, cod liver and other oils, without containing any new observations.

iv. In view of the small numbers of lepers in the Netherlands no special measures are required to prevent an increase of the disease, but they should receive the best treatment in a small sanatorium, which should be founded for the purpose.

L. R.

THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION (24, Cavendish Square, London, W. 1.).

This Association has been founded in London with the objects set forth in the attached statement, and it is desired to get into touch with all agencies and workers for the relief of leprosy in the Empire. The Association wishes to ascertain what is being done in each country, and how it can best assist such work, with the object of reducing the disease as rapidly as possible by taking full advantage of recent scientific progress, especially as regards improvement in treatment. Readers are therefore asked to send to the Medical Secretary information on the lines of this questionnaire, and so assist the Association in its work.

QUESTIONNAIRE.

- (1) Name of country or area dealt with :
  - (a) Area in square miles
  - (b) Population by race or religion and its distribution
  - (c) Climate and other relevant facts
- (2) Census or official rate *per mille*. If not available give your own estimate
- (3) What legal powers exist as regards :
  - (a) Compulsory segregation
  - (b) Prohibition of occupations concerning food, clothing, and domestic service
  - (c) Are there legal powers to repatriate leper immigrants and those developing it within a given period after arrival
  - (d) How far are such powers exercised ?
- (4) Give for each leper institution :
  - (a) The accommodation
  - (b) Aggregate numbers of each of the last three years
  - (c) The proportion of voluntary admissions
  - (d) Can cases be detained until non-infective ?
  - (e) Are members of the family of lepers examined periodically for incipient leprosy ?
- (5) What are the rules regarding :
  - (a) The separation of the sexes
  - (b) Marriage of lepers of reproductive ages
  - (c) Cohabitation of married lepers
  - (d) Separation of lepers' children at birth
  - (e) Frequency of leprosy in separated children and their age at time of development
  - (f) Ditto of children living with leper parents
  - (g) What is the birth rate of married lepers ?
- (6) What is the staff of the institution as regards :
  - (a) Medical qualified men resident and visiting
  - (b) Nurses or attendants qualified to give remedies hypodermically  
If not yet available could any be trained for such work ?
- (7) What type of buildings are used, and how far are they and the equipment satisfactory ?
- (8) What treatments are used, and how long have soluble preparations of chaulmoogra and other oils been injected, and with what results ?

- (9) If the improved treatments are not yet in general use would you give them a trial of at least one year if the Association can send supplies and directions for their use ?
- (10) Could such treatment be superintended by a competent doctor attending at least once a week and a full report of the trial sent to the Association ?
- (11) Are lepers treated at general hospitals, and could separate out-patient leper clinics be established for early cases as has been done successfully in Calcutta ?
- (12) In addition to improving treatment, in what ways could the Association best help you ?
- (13) Have you any suggestions to make regarding the proposed lines of work of the Association ?
- (14) Please supply any additional information of interest regarding the prevalence and modes of spread of leprosy
- (15) Do the indigenous population employ any special remedy against leprosy, and if so, can you obtain some for investigation ?
- (16) Do you see the Tropical Diseases Bulletin, or would you like to have abstracts of leprosy papers ?
- (17) Mention any local customs or conditions affecting leprosy work
- (18) How is your area off for hospitals, qualified doctors, and public health activities ?
- (19) Please state how you consider the extinction of leprosy could be effected
- (20) What is the prospect in your area of Government and public support for an anti-leprosy campaign ?
- (21) Please give other relevant facts, if any, not covered by this questionnaire

The following extracts are taken from the Memorandum of Sir Leonard ROGERS, Medical Secretary, regarding the Medical Policy of the Association.

The objects are—

1. To extend the application of the improved methods of treatment as rapidly as possible throughout the Empire by (a) supplying the latest information and the most approved drugs to leper institutions, settlements and hospital clinics ; (b) training those in charge of lepers in applying the treatment efficiently.

2. To support sound schemes of segregation, with the best treatment, in countries where the great majority of the lepers can thus be dealt with and the disease rapidly reduced, as in the West Indies, etc.

3. To collect information and statistics and to issue bulletins of information to workers among lepers.

4. To support further researches on both the etiology and treatment of leprosy with a view to discovering more efficient methods of prevention and to further simplify, shorten, and cheapen the curative measures.

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#### CORRIGENDUM.

Dr. R. R. SCOTT, Medical Officer of Health, Dar-es-Salaam, points out that under heading Tanganyika Territory in Vol. 20, No. 6, p. 483, the annual report of the Sanitation Branch of the Medical Department should have been attributed not to him but to Lt.-Col. D. S. SKELTON,

Senior Sanitation Officer. The authorship of the section in question, the leprosy portion of which was summarized, is not stated in the Report.

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- BERNUCCI (F.). **Nota sulla alterazioni della innervazione cutanea nelle varie forme di lebbra. (Comunicazione preventiva.)**—*Giorn. Ital. d. Malat. Vener. e d. Pelle.* 1923. May. Year 58. Vol. 64. No. 2. pp. 547–549. [See this *Bulletin*, Vol. 20, p. 824.]
- BIEHLER (Ryszard). **Próby szczepienia tradu na kozach. Lepra Impfversuche bei. Ziegen.**—*Przegl. Epidemiol.* Warsaw. 1922. Vol. 2. No. 2. pp. 235–237. With 1 text fig. [German summary p. 238.]
- DELAMARE (G.). **Lèpre tubéreuse avec hyperostoses tibiales ; lèpre pachydermique avec glossite scléreuse.**—*Presse Méd.* 1923. June 20. Vol. 31. No. 49. pp. 549–551. With 6 text figs. [6 refs.]
- HIRSCHBERG (M.). **Dystrophie adiposogénitale (Syndrome hypophysaire adiposogénital) chez un lépreux.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 75–77. With 1 text fig.
- HUDELLET (G.). **Lèpre et Aïnhum.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 648–651. With 2 text figs.
- METALNIKOV (S.) & TOUMANOFF (K.). **La lèpre chez les Insectes.**—*C. R. Soc. Biol.* 1923. Nov. 10. Vol. 89. No. 31. pp. 935–936.
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